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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/710,649	07/27/2004	Shawn Midlam-Mohler	81102450 / FMC 1777 PUS	4648

28395 7590 02/06/2007

BROOKS KUSHMAN P.C./FGTL
1000 TOWN CENTER
22ND FLOOR
SOUTHFIELD, MI 48075-1238

EXAMINER	
TRAN, DIEM T	
ART UNIT	PAPER NUMBER
3748	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/710,649	MIDLAM-MOHLER ET AL.	
	Examiner	Art Unit	
	Diem Tran	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-20 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1,4-10 and 13-20 is/are rejected.

7)☒ Claim(s) 2,3,11 and 12 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 4-10, 13-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagai et al. (US Patent 6,792,750) in view of Orzel et al. (US Patent 6,581,371).

Regarding claims 1, 10, 19, Nagai discloses a system for controlling exhaust emission oxides of nitrogen (NOx) during restarts of an internal combustion engine (ICE), the system comprising: a first sensor (25) for determining a first level of exhaust gas oxygen at a location upstream of a catalytic converter (19); a second sensor (26) for determining a second level of exhaust gas oxygen at a location downstream of the catalytic converter (see Figure 1); and a controller for performing a rich air fuel ratio following the discontinuation of the engine stop to reduce NOx emissions when an oxygen storage amount of the catalytic converter exceeds a predetermined amount (see col. 12, lines 36-46, col. 13, lines 6-10, col. 14, lines 8-12, 24-28, 54-67); however, fails to disclose that an oxygen storage amount of the catalytic converter is determined based on a difference between a first level of exhaust gas oxygen and a second level of exhaust gas oxygen located at the mid-bed of the catalytic converter.

Orzel teaches that an oxygen storage amount of the catalytic converter is determined based on a difference between an upstream sensor and a mid-bed sensor of the catalytic

converter (see col. 1, lines 26-34, col. 5, lines 55-58). It would have been obvious to one having ordinary skill in the art at the time the invention was made, to have utilized the teaching of Orzel in the modified Nagai method, since the use thereof would have provided an effective means to control an air fuel ratio of an engine based on an oxygen storage amount in the catalyst.

Regarding claims 4, 13, Nagai discloses all the claimed limitations as discussed in claims 1, 10 above, however, fails to disclose that the at least one process to reduce NOx emissions comprises minimizing pumped oxygen. It is well known to those with ordinary skill in the art that in order to reduce NOx emission, an oxygen amount supplying to the engine needs to be minimized. Therefore, such disclosure by Nagai is notoriously well known in the art so as to be proper for official notice.

Regarding claims 5, 14, Nagai discloses all the claimed limitations as discussed in claims 1, 10 above, however, fails to disclose that minimizing pumped oxygen comprises closing a throttle during shutdown. It would have been obvious for one having ordinary skill in the art that during engine shut down, a throttle valve is controlled for closing to reduce an intake air flow and to minimize a pumped oxygen.

Regarding claims 6, 15, Nagai further discloses that the at least one process to reduce NOx emissions comprises providing rich fueling during the engine restart condition to re-condition the catalytic converter (see col. 12, lines 36-45).

Regarding claims 7, 16, Nagai further discloses that at least one of the first and second levels of exhaust gas oxygen is determined using a heated exhaust gas oxygen (HEGO) sensor (see col. 6, lines 1-15).

Regarding claims 8, 17, Orzel further teaches that at least one of the first and second levels of exhaust gas oxygen is determined using a universal exhaust gas oxygen (UEGO) sensor (see col. 4, lines 45-47).

Regarding claims 9, 18, Nagai further discloses that the catalytic converter is a three-way catalytic converter (TWC) (see col. 6, lines 33-40).

Allowable Subject Matter

Claims 2, 3, 11, 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication from the examiner should be directed to Examiner Diem Tran whose telephone number is (571) 272-4866. The examiner can normally be reached on Monday -Friday from 8:30 a.m - 6:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (571) 272-4859. The fax number for this group is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about

the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 800-786-9199 (toll-free).

Diem Tran
Patent Examiner
Art unit 3748

DT

THOMAS DENION
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3700